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DEATH FROM CORROSIVE SUBLIMATE.—WAS "BED-BUG POISON" THE PREPARATION EMPLOYED?*

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BY JAMES C. WHITE, M.D., BOSTON.

AT the last meeting but one of the Society, Dr. Cabot exhibited the œsophagus and uterus of a female, who had died the same day, at the Massachusetts General Hospital, with symptoms of an irritant poison. The uterus contained two fœtuses, neither of which was farther advanced than the fourth or sixth week. On the next day, Aug. 27th, the following articles were received, under seal, from Dr. W. E. Townsend, who conducted the *post-mortem* examination, under authority of Dr. Stedman, coroner:—1st. Portion of a liver. 2d. The stomach. 3d. The intestines, large and small. 4th. Some matter ejected from the stomach by vomiting, while in the hospital. 5th. Matter passed from the bowels during life.

The jar, in which the stomach was placed, contained besides that organ two ounces of an odorless, bloody fluid of the density of serum, and slightly acid to litmus. This was tested for free acids and for mercury, but it contained neither. The stomach itself had been opened along the larger curvature. Its inner surface presented the appearance of having been scorched in some places, varying from a reddish slate color to an almost perfect black, while other parts were of a bright or purplish red. The inner coat, where the color was deepest, was easily lacerated and torn up by the finger nail, and in other places seemed converted into a pultaceous mass, resembling muddy mucus. A piece of litmus paper placed upon its interior gave a faintly acid re-action. The abdominal surface of the stomach had a natural appearance. One third of the organ was cut up into small pieces and thoroughly disorganized by means of hydrochloric acid and chlorate of potash. Hydrosulphuric acid threw down from this solution a black pre-

* The particulars of this case will be fully reported in the Transactions of the Society for Medical Improvement, in our next issue.

cipitate, which was reduced to metallic mercury. Another third of the stomach was treated according to the method of Flandin, that is, by caustic lime, and a part of the mercury thus abstracted is seen in the accompanying tube (vi. notches). Both processes yielded about the same amount of metallic mercury, from which it may be estimated that one eighth of a grain of corrosive sublimate was contained in the whole organ. Examination was made also for other metallic and the alkaloid poisons, but no trace of their presence was detected.

A careful analysis of the liver was made, but no mercury was found.

The intestines throughout their entire length showed signs of inflammatory action, with intervals of healthy tissue. In some parts, the mucous membrane was much reddened and very soft, and in others patches of the same dark color were observed, as in the stomach. They contained no other solid substance than disorganised tissue and a very little fæcal matter. The fluid, in which they were lying, resembled the bloody discharges from the bowels contained in another vessel. An attempt was made to extract from a portion of it corrosive sublimate, by ether, but in vain, although the most delicate tests known were employed. The intestines themselves were not examined chemically.

The amount of vomited matter received was four fluid ounces; dark coffee color, odor of beer. Slightly acid by litmus. Some viscid matter floated upon its surface, which was found by the microscope to be disorganized tissue from the lining membrane of the stomach. A small portion was tested for the presence of mercury, and the metal thus abstracted is preserved in a tube. An attempt to abstract corrosive sublimate, as such, from the vomitus was made, but as in the case above mentioned none was obtained.

The quantity of the dejection received was one pint and a half. It was a faintly acid liquid, of a dull red color. At the bottom of the vessel was a deposit consisting of pulpy, disorganized tissue, mucus, and fæcal matter. The quantity of metallic mercury extracted from eight ounces of this fluid was quite large. Corrosive sublimate, as such, however, could not be obtained from it.

From the results of the chemical analysis thus briefly stated, it will be seen that mercury in some form was present in considerable amount in the tissues of the stomach, and abundantly so in the matter rejected from that organ, and that which passed the intestines during life. Both the symptoms exhibited before and after the arrival of the deceased at the hospital, and the appearances revealed by the *post-mortem* examination, confirm the suspicion that death was caused by the action of some strongly corrosive and irritant poison. They were identical, in fact, with those generally produced upon the human system by corrosive sublimate when taken in large doses. Chemical analysis reveals the fact

that mercury had been taken in quantity sufficient to cause death, that it had been taken in some soluble and highly corrosive form, and that no other poisonous substance had assisted in its fatal work. It would seem a very easy matter, in a case like this, where the tissues are partially destroyed by the agent employed, and where the fluids passed subsequently to its exhibition are highly charged with it, to detect in them its true nature. Unfortunately, a chemist is seldom able to obtain so satisfactory a result when corrosive sublimate is given in solution. He can conclusively demonstrate the presence of mercury in the tissues and animal fluids, but beyond this it is generally a matter of inference. He may judge, too, whether the mercury has been taken in some soluble and corrosive form from the effects produced, and of this no case could be better illustrative than the present, and knows that but few of the mercurial salts possess these properties. He may also be able to satisfy himself that more chlorine is met with in the processes employed than is to be accounted for except by the supposition that it is combined with mercury in the form of a bichloride. Corrosive sublimate, when in solution, forms so intimate a union with the albuminous bodies it finds so abundant in the human economy, that it becomes, in fact, almost an impossibility to separate it from them, except by the use of re-agents so powerful as to decompose it, and thus render its detection a matter of uncertainty. That this stable compound of the bichloride and albumen does not yield up its mercurial salt to ether or alcohol by any means as easily as writers on toxicology state, is demonstrated by the present case, for the most delicate tests failed to give any satisfactory proofs of its presence in any of the matters examined, although there is not the slightest doubt that they all contained it in considerable amount. The symptoms exhibited during life, the *post-mortem* appearances, and the results of the chemical analysis, all unite, then, to furnish proof positive that Ellen Dugan died from the effects of a large dose of corrosive sublimate.

The case, however, is one of far higher importance in a medico-legal aspect than the facts presented at the previous meeting seemed to express. Members of the Society may have seen in the Boston *Journal* of last Saturday (Sept. 21), a long communication headed "A Death-bed Confession," which, to one conversant with the particulars of this tragedy, seems very like the exparte plea of a lawyer, prepared for a jury, had the case ever come to trial. Inasmuch, however, as some knowledge of the *real* facts is essential to a proper understanding of the scientific evidence, which played so important a part in the disposal of this case, and as many of the gentlemen present may not have read the article referred to, I will state them in a few words, as they were developed at the coroner's inquest. The deceased, it appears, was taken

suddenly ill with alarming symptoms on Sunday night, Aug. 25th, at the house of her master in Jamaica Plain, where she had been living as a domestic for three years. Dr. Severns saw her there, and brought her the same night to the Mass. General Hospital. There was violent purging and vomiting both before and after her arrival there, together with other ordinary symptoms of poisoning by large doses of corrosive sublimate. She died at 10 o'clock on the following morning. According to the statement of the attending nurse, the patient was unaware of her dangerous condition, until she told her of it, and asked her what she had been taking. She then replied, that as she was about to die, she would tell her the whole truth:—That she was in the family way by her master, and had been taking some medicine he had given her for three weeks, but that as it had not produced the desired effect, and as her mistress was to return in a day or two, she had taken a larger dose, that she might be well before then. That she had been in the same way by him a year ago, and had got rid of the child at that time by similar medicine. She died shortly afterwards, fully in the possession of her senses. The body was taken possession of by the coroner, and the matters above referred to were placed in my hands for chemical examination. The result of my investigations was communicated to the coroner on the following day, and the person thus accused by the deceased was arrested on his authority, on the charge of attempting to produce abortion by corrosive sublimate. On the day following the committal, I received a note from the counsel of the accused requesting me to give a portion of the matters placed in my hands by the coroner, to Dr. Hayes for analysis. The same legal gentleman employed a detective also subsequently, to search the house at Jamaica Plain, who brought to Dr. Hayes a preserve jar containing vomitus, which had stood several days in an open vessel in the chamber of the deceased, and a bottle nearly empty, said to have been thrown into the garden by her, and to have been found there. It was a bottle which had held "bed-bug poison;" a nearly saturated solution of corrosive sublimate in alcohol, tinged yellow by turmeric.

Aug. 3d, I received both these bottles from Dr. Hayes, who informed me that he thought he had been able to detect in the vomitus some of the peculiar coloring matter of the bed-bug poison. It was upon this opinion, then, that the able counsel employed by the accused would found their defence, and the plea was raised that the girl died a suicide. The matter was brought before the grand jury of Norfolk County, and after a very hasty examination, the case was dismissed, and the person accused discharged. I do not propose to consider here the propriety of such a proceeding or the manner in which it was conducted, except in so far as the judgment of the district attorney was influenced by the scientific testimony presented to him. If we adopt the view stated by the

writer of the communication mentioned, who seems to have been intimately connected with the affair, it was chiefly upon this testimony that no bill of indictment was found.

I will say, in the first place, that I examined the bottle marked "poison," which contained about one drachm of a pale-yellow fluid, and a white deposit. It was found by analysis to be an alcoholic solution of bichloride of mercury, and the white deposit was the same substance probably left undissolved by the evaporation of the fluid. Some of this fluid, when evaporated with boracic acid, gave a red color to the edges of the deposit, and ammonia being added to another portion produced a white precipitate of mercury and a dull claret color. These reactions are indicative of the presence of turmeric. The fluid resembled, though paler, that contained in a bottle of the same character, full of liquid, which was procured by the male servant of the accused from the apothecary, who had furnished the empty bottle to the household some time previously for the purpose of destroying vermin. A portion of this latter, also given me by Dr. Hayes, to whom it had been delivered by the boy just mentioned, was treated by hydrosulphuric acid. The mercury was thus separated from the coloring matter, which by farther purification was found to possess the peculiar odor of turmeric, and was changed to a reddish-brown color on the addition of a solution of potash. It may be well to say here that turmeric owes its coloring properties chiefly to the presence of curcumin, a resinous substance which is readily soluble in ether and alcohol, but insoluble in water. It is recognized by imparting a red tint when evaporated with a solution of boracic acid, and by the change of its bright-yellow tint to reddish-brown when in contact with solutions of potash or soda. Ammonia produces a bright claret color.

About three ounces of what purported to be the vomitus of the deceased (taken from her chamber several days after her death), was received from Dr. Hayes. It resembled closely in appearance that delivered to me by the coroner, and described above. On examination, it was found to contain more mercury than the matter rejected at the Hospital, but the most careful analysis failed to detect any corrosive sublimate, as such, in it. This fluid was agitated with the same amount of pure ether, and allowed to stand thirty-six hours. The ethereal solution, clear and nearly colorless, was then poured off and evaporated. A small amount of yellow oily matter was thus obtained, which dissolved in alcohol, and yielded, on evaporation, a very slightly-colored fatty matter. Slips of bibulous paper were immersed in the alcoholic solution repeatedly, and dried. They were not colored yellow by this treatment, nor brown by subsequent soaking in alkaline solutions. A portion (one ounce) of the vomitus received from the coroner was then subjected to the same process. The golden-yellow oil thus obtained was treated with alcohol, and the solution concen-

trated to a small bulk, and taken up on small strips of filtering paper. The papers on drying assumed a bright-yellow tint, which did not become brown when moistened by solutions of potash or ammonia. Some of the alcoholic solution was evaporated to dryness with boracic acid, but no red color was produced.

Orfila, in his toxicology, refers to the production of this yellow oily matter in the course of the processes most generally employed in the analysis of the human stomach and other organs, and states that it is colored brown on the addition of alkalies. This change of tint, it will be remembered, is the characteristic reaction of turmeric, and might easily lead to error of judgment in a case like this. Moreover, there are many other coloring matters which undergo similar changes of color under the same circumstances besides turmeric, so that no one can state conclusively that a yellow coloring matter becoming reddish-brown on the addition of an alkali is turmeric. Curcumin is so easily soluble in ether and alcohol, that they could not fail to extract it when present. The ethereal solution of the vomitus received from Dr. Hayes, which, if we look upon it as entitled to judicial recognition, would be likely to contain a larger quantity of whatever drug was taken than that collected at the Hospital, was nearly colorless, but yielded, on evaporation, a slight amount of yellow oily matter, which being taken up by filtering paper, did not change color in the least in the presence of an alkali. The ethereal solution of the matter rejected from the stomach at the Hospital, however, had a bright-yellow tint, which was readily imparted to slips of bibulous paper. In this case, too, the strongest alkalies failed to produce the slightest change of color in the papers thus prepared. It may be that this yellowness was imparted by the presence of bile, which probably flowed into the stomach in greater quantity after repeated vomiting, which will account for its increased amount in the vomitus just before death. Even supposing the deceased did take a large dose of the bed-bug preparation of corrosive sublimate, and this, as well as any other, may be purposely administered in small doses, it is very doubtful if the slight amount of turmeric contained in any quantity she could have swallowed, could be detected after the first vomiting, and it appears by the testimony given in the *Journal* alluded to, that she did vomit at least once, and threw it out of the window when she found that a physician had been called. That, however, is a matter of conjecture. A matter of certainty, however, it is, that had there been any recognizable quantity of turmeric in either specimen of the vomitus, it must have been extracted and detected by the processes employed. A yellow coloring matter was obtained; it was taken up by bibulous paper, and thus presented in the most favorable condition to the action of the alkalies. If the paper had changed to a brown color, when treated with a solution of potash, no chemist would be justified in concluding that such change was absolutely due to turmeric, but as the

papers, yellow in color, did not undergo any such change of color, though submitted for a long time to the action of the alkali, we feel bound to state that in our opinion there is not the slightest chemical evidence to show that turmeric, or the peculiar bed-bug preparation of corrosive sublimate, was taken or administered in this case.

DR. WARE'S LECTURES ON GENERAL THERAPEUTICS.

Lecture VIII.—(Concluded.)

This consideration of the method of managing the bowels suggests a similar view of the management of the urinary discharge. This is equally to be made the object of constant attention and superintendence. It is not sufficient to attend to it when its condition and mode of discharge is a principal element in the case, but in all cases to know how this function is going on. The character and quantity of the secretion and the mode of its discharge may have an important connection with diseases that in themselves do not proceed from or have any original relation to the kidneys or bladder. They may also admit measures of relief that will aid the system very much in its efforts, and on the other hand the neglect of such measures will often counteract these efforts and render them of no avail.

I do not propose to speak of the absolute diseases of the kidneys and bladder, these belong to a different part of our subject, but simply of those conditions that may arise in the course of ordinary diseases and may affect the comfort or state of the patient, although they may be only accidental.

The urine, in health, ought to be discharged at least three or four times every day. There are few persons in health in whom it takes place less frequently than this, and very many in whom it occurs oftener, particularly infants and young children. In old persons it may also often occur more frequently, but this is from a different cause; not from any necessity dependent on the quantity of secretion, but from an irritability of the bladder which incapacitates it from retaining its contents for any great length of time. In sickness we ought to be assured that the evacuation takes place at least twice a day, and if less than this, the state of the patient should be carefully watched in this particular. If this continues only a few days, and no symptom presents itself indicative of evil connected with it, no special interference will be necessary, particularly if opiates have been taken, because these at once diminish the secretion and the sensibility of the bladder to its presence, so that it tolerates a considerable accumulation. But whenever this deficiency exists, from whatever cause, the patient should be called upon to make voluntary efforts. These are usually sufficient. Where they are not, an enema or cathartic will often an-

swer the purpose. Where they do not, the nature of the difficulty should be thoroughly investigated.

In the first place, the secretion may be deficient. This may be transient, and even if it continues for some time, be attended with no evil result. It is not an uncommon attendant of acute diseases of all kinds, to a certain extent. The quantity secreted may be very small indeed, without injury. There is an immense difference in the indication between a very little and none at all. Whenever *no* urine is discharged for more than twenty-four, or at most thirty-six hours, and the means just mentioned do not procure it, the catheter should be introduced to determine whether any is secreted. If none be found in the bladder, the patient, to say the least, may be in a state of great hazard. It is true that the cause may prove an innocent one. It may depend upon some peculiar nervous condition, as in hysterical females, but on the other hand it may depend on that state called—though with very little propriety—"paralysis of the kidneys." But whatever the cause of an entire suppression, if long continued it is a symptom of a most grave and generally fatal character. The nature and treatment of this affection does not come within our present purpose.

We may find, however, that there is urine in the bladder. The quantity may be small or large, but there has been no perception of its presence, and consequently no call to discharge it, and no power, when a voluntary effort has been made. Where the quantity is small, an attempt should be made to increase it by diuretics, for thus by its mere bulk the urine may excite the bladder to discharge it. Where the quantity is large, it should be regularly drawn off by the catheter, since its presence in the bladder, even if it produce no local discomfort, almost infallibly excites some general disturbance and gives rise to symptoms that are sometimes alarming. Thus, in typhoid, the simple failure to discharge a large quantity of urine which the bladder retains, will occasion a great aggravation in the state of the pulse, of the skin, of the tongue, of the abdomen, and the mind, symptoms at once relieved by the regular use of the catheter as long as the impediment continues.

This state of things, viz., incapacity to discharge, without perception on the part of the patient of the necessity for it, is liable to occur under various circumstances, but is noticed most frequently in the advanced stage of acute diseases, especially where the mind has been affected; and it is often due to the approach of the comatose condition in affections of the brain. It may depend upon causes existing in the urinary apparatus itself, but more frequently is connected with the state of some part of the nervous system, as in paraplegia and hysteria.

We may find a state of things quite different from this. The patient may fail to pass urine, but he has a desire to do so, perhaps feels the need of it intensely and painfully, and makes fre-

quent and strenuous, but ineffectual efforts. On examination, the bladder is found full. This may arise from a want of contractile power in the organ, or from some mechanical obstruction. The catheter is the main dependence in this case, though many other measures may be employed, such as mucilaginous drinks, enemata, cathartics and fomentations. A large proportion of cases of this description are surgical, and depend upon some actual affection of the apparatus itself.

There are other cases in which the bladder becomes distended with a large quantity of urine, but without any considerable uneasiness, and when it is reported to us by those around the patient that he passes a sufficient amount. The fact here is, that the coats of the bladder are put upon the stretch till their mere mechanical reaction forces out the urine, frequently or continuously, by a small stream. The resistance of the surrounding parts to the distension, and so too the occasional contraction of the abdominal muscles when voluntary efforts are made, keep up the appearance of a free discharge, and yet the bladder has no power of emptying itself naturally and entirely, and may become enormously distended; yet there is usually very little if any mechanical obstruction. The diminished contractile power of the muscular coat is not sufficient to overcome the normal resistance of the sphincter. This state of things may be entirely overlooked, unless carefully investigated, and we may be surprised at finding, suddenly, a large tumor in the bowels, and, on passing the catheter, draw off several pints of water. There is no remedy for this but keeping the organ empty by the instrument; in this way it will usually regain its natural contractile power, but in some old persons it becomes a chronic condition, and requires constant artificial assistance.

In females, especially the nervous and hysterical, difficulties in the passage of urine are more frequent than in men, and, as they are often reluctant to speak of it, it should be made a subject of inquiry. In them the functions of this apparatus are especially under the influence of the imagination and the apprehensions, and the harmonious action of the several parts concerned in the evacuation are very easily disturbed by affections of the mind. I have known a woman who could not pass water when any other person, even her nurse, was in the room. This is but a single example of the slight causes that are sufficient to embarrass this function. The same delicacy of arrangement which in some cases produces retention, in others occasions incontinence; and the same mental agitation which in one female will prevent the voluntary passage of urine altogether, will, in another, cause it to gush away continually without any power of restraining it. Connected with this there is often from the same cause a variation in the quantity of the secretion. It may be very much diminished, but more frequently it is increased, and a well-known phenomenon is the formation in the kidneys of a large quantity of very light-colored urine—hardly to

be distinguished from clear water. This usually attends hysterical paroxysms, and is in them most marked. Still it is by no means confined to them, but may occur in all nervous diseases. It is usually to be regarded as a favorable indication as to the nature of the case. Cases in which it occurs are usually less severe than they appear. But this is not uniformly so, for it not infrequently presents itself in the most grave diseases of the organs of the nervous system, such as the various organic diseases of the brain. These variations do not usually require any interference, except by those means already referred to.

Conditions similar to the several ones which have been spoken of, occur also in young children. In their acute diseases, difficulties in the discharge of urine are not uncommon, but are almost invariably relieved at once by procuring an evacuation from the bowels, or by poultices, fomentations or the warm bath. Diminutions of the quantity of the secretion are commonly accompanied by an increase of fever, by restlessness and want of sleep. These symptoms are not necessarily the consequence of a fault in secretion, but may be the coincident results of the same state of disease. However this may be, no better remedies can be employed than the saline diuretics and the mild ethereal preparations, such as the nitrous spirits of ether.

Dysuria, strangury, too frequent micturition, with burning and uneasiness, and various other uncomfortable conditions attending micturition, are very common, especially in female patients, and though not formidable as to the final result, are very annoying, and often impede recovery. These depend often on a local irritated state of the bladder and urethra—often on some affection of the womb—and often, also, on some trouble in the rectum. Without determining precisely the seat of the difficulty, which cannot always be done, these can usually be relieved by certain common applications—such as compresses wet with either cold or warm water—poultices applied to the parts—warm fomentations—emollient injections to the vagina and rectum—and free dilution with emollient drinks, such as those made of flax-seed, elm bark, gum Arabic, and the seeds of the cucurbitaceous plants, squash, pumpkin, and watermelon. A decoction of peach leaves is often efficacious on a different principle. Very likely much of the relief afforded in this way is due to the increase in the quantity and diminution of the strength of the urine; still it is often greater than can be altogether accounted for in this way. These remedies have the recommendation that they can be used indiscriminately without any very nice diagnosis, and serve to occupy the patient's mind, which is no small benefit. In cases of great suffering, as in acute strangury from blisters, an enema of any mild liquid, with laudanum, gives almost certain and immediate relief, and should be always resorted to.

With regard to all the troublesome symptoms which arise from

the state of the rectum and urinary apparatus, it should be borne in mind that their effect in annoying the sick and of disturbing, not only the parts concerned, but the whole system, especially in feeble and nervous persons, and in the advanced stage of disease, is vastly out of proportion to their actual importance. Still, as the removal of suffering and promoting comfort is one of the great objects of medical treatment, and as all suffering and all discomfort has at least some influence in impairing the power of recovery, they are circumstances we are always to relieve, if possible, however trivial they may be as to their cause.

There are two causes of irritation in these organs which it is always important to determine and remove; not that their presence is necessarily very obscure, but because they often produce effects, the connection of which with them as a cause is not always readily detected—these are ascarides and piles.

Ascarides are chiefly noticed in children. They frequently produce distinct local symptoms, such as burning and itching, sometimes indirect effects in the generative organs, such as leucorrhœa, pruritus and dysuria in the female, and erections and perhaps incontinence of urine in the male, and sometimes the more general disturbances which are usually indicative of an extensive irritation of the lower part of the alimentary canal. There is no certain sign that the symptoms present are owing to ascarides, except their external appearance, for the same symptoms may be produced by other causes. But in all such cases, they should be suspected among the sources to which the trouble may be attributable, particularly where the origin and nature of the case are at all obscure. Though far less frequent in adults, they are sometimes the cause of very troublesome affections of the rectum, which may be treated in vain by all other means, but are removed as soon as this cause is detected and removed. A very effectual mode of relief is the introduction into the rectum of a bougie, or some suppository which has been dipped in whale oil, but a great variety of other articles will be found noticed in treatises. These I do not speak of here, as my object is simply to call attention to ascarides as a cause of irritation that may be overlooked in their connection with the points of treatment of which we have been speaking.

The same may be said of piles. When protruding or inflamed, but sometimes when neither in an inflamed or irritated state, they may prove the cause of a good deal of trouble, both in the rectum and generative organs, especially in females, and even of sympathetic pains in remote parts, and of a generally impaired state of health. In all obscure affections, therefore, the condition of the patient in this particular should be accurately determined, and the difficulty, if found to exist, treated by the well-known remedies of this disease. I should mention, however, a point in the treatment that is as important as any single measure—viz., keeping the whole diseased portion carefully within the sphincter.

It is surprising in what a miserable condition the protrusion of a very small amount of the disease itself, or of the inner lining of the rectum, will keep a patient. Patients who attend to this matter themselves are very apt to return the protruded parts improperly, from a want of knowledge of what is necessary. When the return is made with the dry finger, the returned portion or a part of it is very likely to follow as the fingers are withdrawn, or very soon afterwards. The patient should always be directed to perform the operation with two or three fingers well covered with oil, lard, or some ointment; to relax the sphincter by the same downward effort as that for the evacuation of the bowels; then to push the whole protruding portion quite up into the rectum, and withdraw the fingers cautiously, so that nothing shall follow them. A constant attention to these precautions is in all stages of piles one of the most important measures of relief—and, in the early, may prevent their increase, or lead to their permanent removal.

Selections from Medical Journals.

THE BITE OF THE VIPER.—Dr. Viaud-Grand-Marais has collected 203 cases of wounds inflicted by vipers. We subjoin some of his practical deductions:—

"The bite of the viper, like all other envenomed wounds, requires immediate attention, the most important point being to neutralize the poison before it has been absorbed. Three indications thence arise, viz., *to cut off all communication between the wounded part and the circulating system; to expel the venom from the bite; and to destroy it* in situ.

"The first thing to be done after a bite inflicted by a venomous snake of any kind, is to apply *a ligature* at two or four inches from the wound, between the latter and the heart; a neck-tie or handkerchief, a garter, or any other broad band, is preferable to a narrow cord. The ligature should be tightened sufficiently to cause the veins to swell, as in phlebotomy, but not enough to make a deep indenture in the flesh, which would increase the chances of inflammation, and might induce gangrene. This is but a temporary measure, and should not be persevered in for more than three quarters of an hour or an hour at most; and the band should even be loosened or displaced, if any increase of the local symptoms be observed.

"When the injured region (the head, neck, or body) does not admit of the application of the ligature, pressure should be exercised around the wound with the hands, while other methods of treatment are resorted to.

"To meet the second indication, the escape of blood and the extrusion of the venom should be promoted by incision of the punctures and pressure of the neighboring parts. Suction is also an excellent means of extracting poison, whether exercised with the mouth or with a cupping-glass. M. Viaud-Grand-Marais adduces in illustration two cases, which peremptorily demonstrate the beneficial effects of this measure.

"'In the neighborhood of Blain, a man named Civel, aged 34, was bitten in 1858 by a common red-colored viper, while grasping a sheaf of corn. Dr. Sortais, who was fortunately present, applied a ligature, sucked the wound, which was situated in the right thumb, and exhibited hartshorn both externally and inwardly. The patient had entirely recovered from the effects of the injury on the following day.'

"This kind of aspiration extracts the venom with the blood, and the operator

should reject it as soon as it reaches his mouth. The poison, moreover, does not injure healthy mucous membranes: but if any sores existed on the tongue or within the mouth, cupping should be resorted to instead.

"In order to destroy the venom in the wound, appropriate chemical agents are employed. Hartshorn is a delusive agent; the success obtained by Messrs. Brainard and Green points out the watery solution of iodide of potassium and iodine as far more efficacious.

"A sufficient quantity of this fluid should be inserted into the bite. The following is the formula recommended by M. Viaud-Grand-Marais:—R. Aquæ, ℥iss.; potassii iodid., ℈i.; Iodinii, gr. xx. M.

"If this solution could not be obtained, if the symptoms were urgent, and the temperature of the skin falling, a knife, a nail—any iron implement, in short, should be immediately carried to a red heat, and used to cauterize the wound deeply.

"When emesis has supervened, cauterization is superfluous, and the practitioner must trust, for the purpose of checking the further progress of the poison, to sudorifics, tonics, ammonia (a few drops in a cup of tea), spiritus Mindereri, wine, coffee, together with the simultaneous application of cotton-wool and oil-silk, over the diseased parts, blankets, and bottles filled with water."—*Am. Med. Monthly.*

Arsenic Smoking in Asthma.—The known alterative action of arsenic on the mucous membranes, as well as on the skin, would seem to account for its successful employment in asthma. A recent letter to the London *Lancet*, from Frederic G. Julius, M.D., which we re-publish entire, gives the following interesting case:—

"A French lady has been subject to spasmodic asthma for twenty-five years, during twenty-one of which she has been frequently bled, had issues and setons, smoked belladonna leaves and stramonium, taken every species and form of medicine, changed her residence to various places in Europe, and all without the slightest benefit.

"Four years ago, when at Marseilles, Dr. Cauvin read an account to her of the benefit derived by asthmatics in China from smoking arsenic. Her sufferings were so great that, although Dr. Cauvin fully pointed out to her the risk and danger she incurred, she insisted upon trying it.

"She commenced by smoking a quarter of a grain of arsenic three or four times daily in a cigarette, and this she continued to do for about fourteen days, with the greatest benefit to her breathing and general health. She has subsequently much increased the dose, and when she feels an attack of asthma coming on, she does not weigh the arsenic, but takes up what she considers a sufficient dose with a small paper knife. I asked her to-day to give me in a piece of paper the dose she intended smoking, which she did, and on weighing it carefully I found it a little over three grains. I analyzed it, and found it to be pure arsenious acid. I must also mention the important fact that she does not inhale the fumes and blow them out again, as in ordinary smoking, but when her mouth is full she swallows the smoke.

"The only ill effects she has ever experienced is swelling of the eyelids, and, when she first commenced, slight pricking pains in the stomach, but never to any troublesome extent. She considers herself cured. From being in a state of constant breathlessness and suffering, unable to lie down or make the slightest exertion, she is now able to go about like other persons, and is rarely threatened with an attack oftener than once in three or four months, and that is at once checked by smoking arsenic, with a very small quantity of belladonna or stramonium in the dose I have mentioned. She now uses, instead of a cigarette, a small red pipe about five inches long.

"She tells me that Dr. Cauvin has used arsenic in the same way in many cases of confirmed consumption, and has rarely failed in giving great relief and retarding the disease."

Army Medical Intelligence.

We publish the following letter from the assistant surgeon of one of the Massachusetts regiments, now at the seat of war, from which we infer that our volunteer surgeons, untrained though they be to many of the duties of military life, are proving themselves, in some instances at least, faithful and efficient officers, a credit alike to the service and our State.

Fort Albany, Va., Sept. 22d, 1861.

To the Surgeon General.

Dear Sir,—It has just occurred to me that the few minutes of leisure I find on my hands between divine service and the supper call, cannot be better employed than in writing a line agreeably to your pleasant invitation at my last call at your office.

Excepting one week at Kalorama, we have been here since leaving Fort Warren. This fort (which, by the way, you may have visited), is situated on quite a high hill, or rather ridge, but is near enough to the lowlands for malaria to have a "right smart chance" at us. One of our companies has charge of Fort Runyon, two thirds of a mile towards Long Bridge, on the low land; and another has charge of the Virginia half of the Bridge and Fort Jackson, situated at the end of the Bridge and half a mile from Runyon. These two last-named localities are the chosen home of intermittent fever; the New York regiment preceding us there, reporting over four hundred cases in a month, occurring in not more than seven hundred men all told.

When we came in possession of these forts, we found them all filthy to an extreme degree, especially Fort Albany. The New York regiment, while here, had no sinks for sick or well, officers or men; and it is no exaggeration to say that acres were so covered with filth and garbage that only with the greatest difficulty could one walk with unsoiled boots, while the stench was absolutely sickening. By consent of the surgeon, I was appointed by the colonel a "Sanitary Commission," with unlimited authority as to the use of men, shovels, and teams, provided they could be spared from work on entrenchments (which proviso hindered me considerably). Borrowing a plough, I soon turned under a good top dressing upon about an acre and a half, had ditches and sinks dug, and had the garbage of the cook houses carted away and buried every day. That this labor was not thrown away, is proved by the fact that three of the eight companies at this place, though it was called by old residents "a mighty bad place for chills," have no one in the Hospital, and the other five have but six. And so far as the labor and care were concerned—and there was not a little of both—I felt amply repaid when, a few days ago, Gen. McClellan stopped with his staff and escort to say that the camp of our regiment was the cleanest and best ordered of any one within his knowledge—that he considered it as a *model*, and always spoke of it as such.

As soon as we came here, we, at the suggestion of an old army officer, had coffee distributed smoking hot to the men on guard during the night, and I think it has proved beneficial in warding off the effects of malaria. Having three forts, our men have a great amount of guard duty—each man often going on every other day for a week or two, and always twice a week. Recently, Gen. McClellan has ordered coffee in the morning, on rising, to all the men; which, however im-

portant, is in my opinion not as much so as that those out during the night should have it. We are now, in spite of all our precaution, having quite a number of cases of intermittent, though of a very mild type. Most of the cases get well in from three to six days—i.e., of the fever—not up to full strength, and we have not had more than three or four lasting over ten days. To-day we have fifteen in the Hospital, nine being from the two companies at Runyon and Jackson, thirteen being intermittent; and besides these, we have about a dozen very light cases reported "sick in quarters." Very few of our cases have any shaking, or decided chill, but commence with general feverish symptoms. Mild treatment (so mild as to excite the laughter of our neighbors from the West) has proved sufficient so far. A light emetic of ipecac if the symptoms are severe, a little castor oil if any need for it seems to exist, and from six to ten grains of quinine a day, usually winds them up shortly—the quinine being continued in about three-grain doses per diem for a few days after the fever has left.

Of typhoid we have had but one well-marked case, which we left at Kalorama (Columbia College Hospital), when we came here, and which is now convalescent.

Diarrhœa was quite prevalent at first, and we had a few light cases of dysentery; but of late we have had but very little of either.

We have had three deaths—the first very sudden, during sleep, supposed to be "organic disease of the heart," as his father died in the same way. The second died in the Infirmary where he had been placed with fractured femur, at a time when an attack was daily expected; and the third was accidentally shot while on guard.

But I shall weary you if I write any more, if I have not already; so I will merely say further, that I like this sort of life (even including two or three days' service with the pickets at Bailey's Cross Roads, near Munson's Hill), and enjoy myself most when there is most to do.

In addition to this, letters have been received during the week from the Surgeon of the 18th Regiment (Col. Barnes), the Surgeon of the 12th Regiment (Col. Webster), and Surgeon Otis, of the 27th Regiment, in camp at Springfield.

The Surgeon of the 18th writes:—"You will be pleased to learn that our men are in good health. The staff officers are all gentlemen and men of refinement. In such company one can cheerfully submit to toil, privation and fatigue, and the many vexations inseparable from the breaking in of the 'Yankee sovereign' into a soldier. I recently amputated through the metatarsal bone of the lesser toes, for a gunshot wound, leaving the great toe. The stump is a beautiful one."

The Surgeon of the 12th Regiment writes from Pine Camp, near Muddy Creek Ford, Md.:—"Since writing you we have moved our camp from Darnestown to this place, six miles distant. We are now guarding one of the most important fords on the Potomac, and have to keep constantly on the alert, not knowing at what hour we may be attacked. Our camping ground is the most beautiful spot I ever saw—on a high, sandy ground, about a quarter of a mile from the Potomac, and surrounded by pine trees, very well protected from the miasmata rising from the river, and our picket guards have good buildings for headquarters. The men are in remarkable health, only four in hospital. In fact, we could not be more pleasantly situated, and I was never happier in my life."

Surgeon Otis, of the 27th Regiment, in camp at Springfield, writes: "I am gratified to report the remarkably good health of our camp. There were to-night 689 men in quarters. I have three tents provided with rough but comfortable bunks, where I have treated the more serious cases of diarrhœa, which affected a number of the men commencing camp life during the inauspicious weather of the last week. The most serious case that has occurred is a peculiar one, of profuse pulmonary hæmorrhage resulting from a blow on the lower lateral portion of the left chest, accidentally inflicted by the elbow of a comrade while they were drilling at double quick time. The patient, a robust subject, exempt from any obvious thoracic disease, is convalescing. I had a spare servant's room, and provided for him at my house. All my associates on the staff second my exertions for the proper sanitary regulation of the camp."

We are glad to add to the above that other accounts from the regiments are equally favorable, and reflect credit on the Massachusetts medical staff now in active service. The health of the regiments now in camp in this State is remarkably good—a mild form of diarrhœa, easily controlled, being the disease the surgeon is most often called to treat.

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, OCTOBER 3, 1861.

THE ALCOHOL QUESTION AGAIN.—The discussion of the alcohol question still goes on in England. We published, a few weeks since, a lengthy extract from an interesting article by Mr. Daniel Hooper, in the London *Lancet*, advocating the moderate use of stimulants by all classes. His argument would be likely to have more weight in England than with us, sustained as it is by the almost universal usage of the country. There, if anywhere, the burden of proof must rest on those who take the adverse view. Long established custom, and the consequent adaptation of the system to the use of stimulants, greatly complicates the question, and when the habits of a whole community are involved seriously embarrasses the judgment in arriving at a sound conclusion. As usually conducted, the discussion, it seems to us, does not sufficiently take into consideration climatic and other local influences which may have a very important agency in determining the power which stimulants exert on the nervous system. The immense difference in this respect between England and our part of the American continent is a matter of every day experience. So, too, the temperament of the individual, as acted upon by one or the other alcoholic liquid, is a very important element in the discussion. Everybody knows what a marked difference the different kinds of wine have in their effect upon different systems, almost indicating a sort of physiological as well as gustatory elective affinity. All things considered, however, we incline to the views of those who advocate total abstinence rather than daily indulgence. The admitted fact that the highest physical health, when men are being trained for an especial effort which shall task their powers of endurance to the utmost, is best se-

cured by great abstemiousness is a most weighty argument. The experience of armies, which has brought our military authorities to the conclusion that soldiers are vastly less liable to disease when entirely deprived of stimulants, is another. The fact, which is laid much stress upon by some, that because there is hardly a nation known which has not devised a method of preparing some form of them for its own stimulation, and that therefore their use is in accordance with a law of nature, does not seem to us to have much weight. There is not a vice or form of iniquity which might not be defended on precisely the same grounds.

The theory, which has been advanced with considerable plausibility of late, that wine is food, has done much to sustain the course of those who like to have a physiological argument to sustain their habits of self-indulgence. This argument is met in a recent communication in the London *Lancet* by Mr. Metcalfe Johnson, M.R.C.S. As medicinal agents we cannot question the utility of stimulants, in many instances, and their utility seems to be greatly enhanced by previous habits of temperance in the patient. As an occasional indulgence on social and festive occasions we would not decry them; always bearing in mind the danger of imitating that astute old man, whose sheep-washing occasions soon grew into a daily hydropathic discipline for his unfortunate victim, after having received a dispensation for an ardent potation at such times only. The article by Mr. Johnson is as follows:—

"The first question that seems to arise is—What *is* a moderate quantity of alcohol to be taken per diem? Let us say a pint of beer, and inquire what are its effects, and how it may be expended.

"On a person accustomed to its daily use the effect is inappreciable; but to a person habitually a total abstainer it will first cause a temporary exhilaration (lasting, say, for twenty minutes), next a sensation of drowsiness, and for an hour or two after a corresponding depression.

"Now how is it expended?

"One pint of beer will contain about 98·30 grains of alcohol, or 51·24 of carbon, 12·81 of hydrogen, and 34·16 of oxygen.

"Now, if this is assimilated (which is, to say the least, doubtful), is it an economical sort of food? Compare it, then, with an ounce of bread, which contains 118·94 grains of carbon, 40.94 of hydrogen, 315·93 of oxygen, and 4·14 of nitrogen. Now we know that naughty boys can live on bread and water, but do we find that good or bad boys or men can live on beer alone? if they cannot, how can it be a proper food?

"Then comes the question—Is alcohol assimilable? * In large quantities we know that it passes through the blood as alcohol unconsumed. Does any other food proper—say bread, potato, arrowroot, rice, beef, or mutton—ever pass through the blood in the shape of its original composition? Of course not.

"There is one authority to whom Dr. Hooper has not referred, whose investigations of late on the relation of food to respiration have thrown much light upon the subject. I refer to Dr. Edward Smith, of the Hospital for Consumption, who shows, perhaps without intention, but I think most plainly, that alcohol does not deserve to rank as food, inasmuch as it is one of the worst respiratory excitants; and since it is, I think, allowed that food possesses value in proportion as it excites respiratory changes, we shall see that by comparing brandy with bread, the former gives only 0·38 while the latter shows from 1·48 to 2·4 per cent. increase of carbonic acid in respired air.

"Dr. Hooper refers to the brain-operatives as requiring alcohol, while the muscular-operatives work well on ginger beer.

"Now a somewhat extended acquaintance with public lecturers—a class of men

* The researches of MM. Lallemand, Perrin and Duroy point to the fact that alcohol passes in great measure undigested through the blood.

who live by brain-work—has shown me that the successful ones find it most conducive to their studies to pursue them on the total abstinence principle.

"To class alcohol with tea, coffee, and butter, as with foods proper, seems to me a fallacy, inasmuch as tea and coffee are more condiments than foods; while butter is an article of very low respiratory excitation.

"In speaking of alcohol as a poison, we must not forget that Nature has ordained a sort of elasticity in the power of man's digestion which enables him, without harm, to consume a small portion of articles of diet which in excess are poisonous, as tea, coffee, &c.; but this does not of itself entitle them to be classed as foods proper.

"If 'the aim of all food is force,' what relation will alcohol bear to force in those who are not (to use a parallel word) acclimatized to its use?

"In reference to Dr. Chambers's remark, that alcohol does good because a man used to its consumption feels better with than without it, I beg to suggest to such persons to make a trial of a long abstinence from it, and if they find (as they assuredly will) that they can do all without which they formerly could with it, then I think the conviction will force itself upon them that they have hitherto been wasting what might have been turned to a better use than the consumption of the cereals in the shape of alcohol.

"As I do not wish to occupy your space with unnecessary verbosity, I will content myself with observing, that alcohol alone of all other articles of diet fails to satisfy the appetite by consumption. There is a limit to the quantity of beef, bread, &c., as well as of jam tarts, which we can consume, and all the 'standing up' in the world will not enable the eater to use more than a given quantity; but alcohol requires no standing up to enable the consumer to take more than is good for him."

The late Dr. J. H. Lane.—The death of this much lamented physician seems to have been marked by that deep and heartfelt sorrow among those who had enjoyed the fruits of his friendship and professional skill, which shows how faithfully he discharged the duties that devolved upon him as a conscientious physician. Our departed brother has left an example of Christian benevolence which should not be without its influence on those of us who survive.

At his funeral, which was numerously attended, Rev. Dr. Kirk expressed himself in a few brief but eloquent words, and bore his testimony to the high character of the deceased. We quote the following:—

"Physicians, like other men, must live of their profession. Yet, probably, few classes of men do so much unrecompensed professional work as they. Our friend, there is reason to believe, was behind few, if any, in gratuitous service. He had learned that 'it is more blessed to give than to receive.' I have heard of a friend of his, dying, and leaving a family entirely without property. The widow and the orphans, for twenty-three years, have enjoyed the same unremitted, kind, skilful attentions, the same professional services, unrequited. They cannot be unwilling I should record it here. In fact, it is already appearing that his left hand was not permitted to know the beneficent doings of his right hand. Grateful utterances are already mingling with the exclamation from many: 'Ah! I have lost an invaluable friend.'"

We have received the following note in reference to Dr. Cotting's ingenious extension apparatus for fractured thigh. The objections it contains are met to some extent by the note from Dr. C. which follows. In further reply to the queries it contains, it might be said that, practically, Dr. Cotting's apparatus works well and comfortably for the patient, as it stands.

Messrs. Editors,—I observe, in the last number of your excellent Journal, a brief account, by Dr. B. E. Cotting, of an ingenious appli-

ance for the treatment of fractured thigh; and I should like, in connection with this subject, to present a few thoughts to Dr. Cotting for his consideration.

The first point which I desire to note is, that the muscular structure of the thigh is made up of twenty-five muscles, twelve of which arise from the pelvis and are inserted into the thigh-bone; six arise upon the thigh-bone and are inserted into the tibia; six arise upon the *pelvis* and are inserted into the tibia; and one has both its origin and insertion near the knee-joint. The difficulty to which the Doctor adverts, of "maintaining permanent extension adequate to prevent shortening of the limb," is all to be found in those muscles which hold between their extremities two joints, the hip and knee; and these muscles are the six which arise upon the pelvis and are inserted into the tibia, and only *two* of those have anything to do with it—the sartorius and gracillis.

These muscles are the longest that they can be made, when the body and limb are in position assigned by Dr. Cotting for treatment; while the other four are short of their extreme length by from two to four inches. If the Doctor should lay his patient upon the back, and flex the thigh upon the body to an angle of sixty degrees, and then lay the leg horizontal, the distance between the points of origin and insertion of the sartorius muscle would be from four to five inches less than it is in the position which he indicates; and that of the gracillis from two to three inches less.

Now, why straighten the limb, and put these muscles upon the stretch? In this bent position everything is loose, and there is no more occasion for all the counter-extending appliances than there is for the hanging of the patient; and why lay it straight and involve one's self in this necessity?

E. Daniels.

Owego, N. Y., Sept. 23*d*, 1861.

"Fracture Apparatus." *Messrs. Editors,*—Dr. Chapin's kind reference is duly appreciated. Mortise holes in side splints, which he lays so much stress upon, though merely a partial copy of Hartshorne's, in use more than twenty years ago, are very convenient whenever the dressing of a wound requires the frequent removal of one of the long side splints. But when a splint cloth is desirable, Flagg's, having mortise holes in the cross-piece, is for obvious reasons much better. Better than either is that which dispenses altogether with the inner long splint, so apt to excoriate the perinæum under the best of care. Strange to say, however, Dr. Chapin, while he thus makes no essential amendment to Hartshorne's or Flagg's apparatus, retains their other objectionable features, viz., the old belt chiefly dependent on the perinæum or groin straps for counter-extension, and the gaiter or common ankle gear. To obviate the difficulties arising from these, and such as these, in actual practice, the belt and stocking described in my paper were adopted, and found adequate. They have been tested many years in many cases of fractured thighs, and not in one single case of the *leg* only, as Dr. Chapin's. They may be employed with any long splints the surgeon may prefer, though the rude one we described will fulfil all indications. They will be found serviceable even when the surgeon tries the double inclined plane, or chooses to risk the flexed position of the limb; but most surgeons will agree with Mr. Fergusson, who says:—"Notwithstanding Mr. Pott's very ingenious

and often-quoted arguments in favor of the bent position, I give decided preference to the straight in most fractures of the thigh-bone, and to the use of such an apparatus as shall keep all steady from the loins downwards, and at the same time permit of that continued extending force being applied which I deem of so much consequence in all fractures of the thigh showing the least tendency to displacement and shortening."

Very respectfully, B. E. Cotting.

Medical School of Maine.—Dr. Wm. C. Robinson, of Portland, has been chosen Lecturer on Materia Medica and Therapeutics in the Medical Department of Bowdoin College, Me., to fill the vacancy made by the transfer of Prof. I. T. Dana to the Chair of Theory and Practice of Medicine. An elegant and commodious college building is now in the process of erection, to be dedicated at the opening of the next course of lectures.

Jefferson Medical College.—We have been informed that Dr. Keating's resignation of the Chair of Obstetrics in this institution, which was presented on account of his ill health, has been withdrawn. It is understood that the former incumbent of the chair, Dr. Charles D. Meigs, will lecture in Dr. Keating's place during the coming season.—*Med. and Surg. Reporter.*

The Sanitary Commission.—The following Philadelphians have been appointed on the Sanitary Commission: G. B. Wood, M.D.; Prof. J. F. Frazer; Samuel D. Gross, M.D.; Henry C. Carey; Rev. Albert Barnes; John C. Cresson; Robley Dunglison, M.D.; Horace Binney, Jr.; Rev. H. J. Morton; Wilson Jewell, M.D.; Rev. H. W. Ducachet; Francis G. Smith, M.D.—*Ibid.*

VITAL STATISTICS OF BOSTON.

For the Week ending Saturday, September 28th, 1861.

DEATHS.

	Males.	*Females*	*Total.*
Deaths during the week,	44	36	80
Average Mortality of the corresponding weeks of the ten years, 1851-1861,	49.5	42.3	91.8
Average corrected to increased population,	..	..	101.86
Deaths of persons above 90,	..	..	..

Mortality from Prevailing Diseases.

Phthisis.	Chol. Inf.	Croup.	Scar. Fev.	Pneumonia.	Variola.	Dysentery.	Typ. Fev.	Diphtheria.
10	16	0	4	2	0	1	2	0

METEOROLOGY.

From Observations taken at the Observatory of Harvard College.

Mean height of Barometer,	30.016	Highest point of Thermometer,	79.0
Highest point of Barometer,	30.212	Lowest point of Thermometer,	43.0
Lowest point of Barometer,	29.584	General direction of Wind,	W.N.W.
Mean Temperature,	59.9	Am't of Rain (in inches)	0.51

Communications Received.—Extracts from the Records of the Middlesex East (Mass.) District Medical Society.

Married,—In Salem, Sept. 24th, Francis H. Brown, M.D., of Cambridge, to Louisa B., daughter of Chas. F. Eaton, Esq. of S.—In Concord, N. H., Sept. 4th, Dr. Geo. H. W. Herrick, of Billerica, Mass., to Miss Jennie V. Beane.—In Warren, R. I., Sept. 23d, James R. Dow, M.D., of Brooklyn, N. Y., to Miss Emilie Richmond, of W.

Died,—At North Conway, N. H., Sept. 28th, whither he had gone for the benefit of his health, Dr. Jacob Hayes, of Charlestown, Mass.

Deaths in Boston for the week ending Saturday noon, September 28th, 80. Males, 44—Females, 36.—Accident, 1—inflammation of the bowels, 2—disease of the brain, 2—cholera infantum, 16—cholera morbus, 1—consumption, 10—convulsions, 1—debility, 1—diarrhœa, 1—dropsy of the brain, 4—dysentery, 1—erysipelas, 1—scarlet fever, 4—typhoid fever, 2—hæmorrhage, 3—disease of the heart, 2—laryngitis, 1—intemperance, 1—disease of the liver, 1—congestion of the lungs, 1—inflammation of the lungs, 2—marasmus, 5—old age, 2—pleurisy, 1—premature birth, 3—puerperal disease, 1—scrofula, 1—sore throat, 1—syphilis, 1—tuberculosis, 1—ulcer (of the stomach), 1—unknown, 4—whooping cough, 1.

Under 5 years of age, 49—between 5 and 20 years, 7—between 20 and 40 years, 11—between 40 and 60 years, 7—above 60 years, 6. Born in the United States, 64—Ireland, 16.